Claims

[c1] 1.A temporal processing controller adapted to receive a first image signal and a second image signal from a scanning unit comprises:

a segmentation module adapted to isolate at least one region of interest of said first image signal and said second image signal, said segmentation module further adapted to generate therefrom a segmentation signal;

a registration module adapted to receive said segmentation signal and register said at least one region of interest, said registration module further adapted to generate therefrom a registration signal; and

a comparison module adapted to receive said segmentation signal and said registration signal, said comparison module further adapted to generate therefrom an adaptive comparison signal of said first image signal and said second image signal.

[c2] 2.The system of claim 1 wherein said scanning unit is adapted to scan an object and generate said first image signal and said second image signal from said object; and

wherein the system comprises an image controller coupled to said scanning unit and adapted to receive said first image signal and said second image signal.

[c3] 3.The system of claim 1, wherein for said region of interest comprising a minor region of said object, at least one rigid body registration transformation, including at least one of translation, rotation, magnification, or shearing, is a criterion used to register said first image signal and said second image signal.

[c4] 4.The system of claim 1, wherein for said region of interest including a major region of said object, at least one warped transformation is a criterion used to register said first image signal and said second image signal.

[c5] 5.The system of claim 4, wherein said at least one warped transformation is implemented through multi-region, multi-scale, pyramidal logic designed such that a different cost function is adapted to highlight changes between said first image signal and said second image signal at each of a plurality of scales.

[c6] 6.The system of claim 5, wherein said cost function includes at least one of

mathematical correlation, sign-change measurement, or statistical analysis.

[c7]   7.The system of claim 1, wherein said first image is one of a one-dimensional, a two-dimensional image, a three-dimensional image, a one-dimensional montage image, a two-dimensional montage image, or a three-dimensional montage image.

[c8]   8.The system of claim 1, wherein said comparison module is further adapted to receive a segmentation mask signal based on at least one known feature of said first image signal, said segmentation mask being generated from at least one of said segmentation module or a user input.

[c9]   9.The system of claim 1, wherein said comparison module further adapted to generate said adaptive comparison signal of said first image signal and said second image signal through an enhanced division method including, $(S1*S2)/(S2*S2+\phi)$.

[c10]   10.A temporal image processing method comprising:
scanning an object and generating a first image signal and a second image signal therefrom;
receiving said first image signal and said second image signal in a segmentation module;
isolating at least one region of interest of said first image signal and said second image signal;
generating a segmentation signal;
receiving said segmentation signal in a registration module;
registering said at least one region of interest;
generating a registration signal;
receiving said segmentation signal and said registration signal in a comparison module; and
generating an adaptive comparison signal in response to said segmentation signal and said registration signal.

[c11]
11.The method of claim 10 wherein generating a segmentation signal further comprises generating a first image signal including a one-dimensional, two-

dimensional image, a three-dimensional image, a one-dimensional montage image, a two-dimensional montage image, or a three-dimensional montage image.

[c12]   12. The method of claim 10 wherein registering further comprises registering a minor region of interest of said object within said first image signal and said second image signal with at least one of translation criteria, rotation criteria, magnification criteria, or shearing criteria.

[c13]   13. The method of claim 10 wherein registering further comprises registering a major region of interest of said object within said first image signal and said second image signal through at least one warped transformation criterion.

[c14]   14. The method of claim 13 wherein registering further comprises registering a major region of interest of said object within said first image signal and said second image signal through at least one warped transformation criterion including multi-region, multi-scale, pyramidal logic; and
wherein the method comprises highlighting changes between said first image signal and said second image signal with a different cost function at each of a plurality of scales.

[c15]   15. The method of claim 14, wherein said cost function includes at least one of mathematical correlation, sign-change measurement, or statistical analysis.

[c16]   16. The method of claim 10 wherein receiving said segmentation signal and said registration signal in a comparison module further comprises receiving a segmentation mask signal, based on at least one known feature of said first image signal, in said comparison module.

[c17]   17. A temporal image processing system comprising:
a scanning unit adapted to scan an object and generate a first image signal and a second image signal of said object; and
an image controller coupled to said scanning unit and adapted to receive said first image signal and said second image signal,
said image controller comprising a temporal processing controller adapted to receive said first image signal and said second image signal in a segmentation

module, isolate at least one region of interest of said first image signal and said second image signal, generate a segmentation signal, receive said segmentation signal in a registration module, register said at least one region of interest, generate a registration signal, receive said segmentation signal and said registration signal in a comparison module, and generate an adaptive comparison signal in response to said segmentation signal and said registration signal.

[c18]   18.The system of claim 17, wherein said scanning unit comprises one of a CT scanning unit, a positron emission tomography unit, an x-ray scanning unit, an MRI scanning unit, an optical imaging unit, or ultrasound.

[c19]   19.The system of claim 17, wherein said comparison module is further adapted to receive a segmentation mask signal based on at least one known feature of said first image signal, said segmentation mask being generated from at least one of said segmentation module or a user input.

[c20]   20.The system of claim 17, wherein said comparison module further adapted to generate said adaptive comparison signal of said first image signal and said second image signal through an enhanced division method including, $(S1*S2)/(S2*S2 + \phi)$.